

App. No.: 10/788,933

February 22, 2006

I. Claim Listing

1-23 (Canceled)

24. (New) An apparatus comprising one or more variable reflectors placed propagationally at one or more locations, wherein the one or more reflectors are adapted to variably reflect and transmit an optical signal, thereby generating one or more generated optical signals, the generated optical signals having one or more relative time delays relative to the optical signal.
25. (New) The apparatus of Claim 24 wherein the variable reflectors being adapted to variably reflect and transmit the optical signal comprises:
- substantially complete reflection and substantially no transmission; or
 - partial reflection and partial transmission; or
 - substantially no reflection and substantially complete transmission.
26. (New) The apparatus of Claim 24 further comprising a waveguide adapted to house the one or more variable reflectors and to facilitate propagation of the optical signal and the generated optical signals to and from the variable reflectors.
27. (New) The apparatus of Claim 24 further comprising an optical detector adapted to receive the one or more generated optical signals, thereby facilitating the generation of one or more electrical signals having one or more corresponding relative time delays.
28. (New) The apparatus of Claim 24 further comprising a substrate for holding the optical waveguide.
29. (New) The apparatus of Claim 24 wherein the variable reflectors are electrically switched Bragg's grating reflectors containing liquid crystal materials.
30. (New) The apparatus of Claim 29 further comprising electrodes positioned near the Bragg's grating reflectors for electrically controlling the Bragg's grating reflectors.
31. (New) The apparatus of Claim 26 wherein the waveguide is coupled to at least one optical coupler.

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32. (New) The apparatus of Claim 26 wherein the waveguide is coupled to at least one optical circulator.

33. (New) A method for generating time-delayed optical signals, the method comprising:

providing an optical signal; and

variably reflecting and transmitting the optical signal at one or more locations, thereby generating one or more generated optical signals having one or more relative time delays relative to the optical signal.

34. (New) The method of Claim 33 wherein the variably reflecting comprises:

substantially completely reflecting and substantially not transmitting; or

partially reflecting and partially transmitting; or

substantially not reflecting and substantially completely transmitting.

35. (New) The method of Claim 33 further comprising:

directing the optical signal into a waveguide; and

variably reflecting the optical signal at one or more locations within the waveguide.

36. (New) The method of Claim 33 further comprising coupling the one or more generated signals to an optical detector, thereby generating one more electrical signals having one or more corresponding relative time delays.

37. (New) The method of Claim 35 wherein the variably reflecting comprises:

placing one or more voltage-controlled, variable reflectors within the waveguide;

placing electrodes near the one or more variable reflectors; and

applying variable voltage to the one or more electrodes, thereby controlling reflection and transmission from and through the one or more variable reflectors.

38. (New) The method of Claim 33 wherein the optical signal has a specific wavelength and modulation format.

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39. (New) The method of Claim 37 wherein the variable reflectors are electrically variable Bragg's grating reflectors containing liquid crystal materials.
40. (New) The method of Claim 37 wherein the electrodes are fabricated near the variable reflectors.
41. (New) The method of Claim 35 wherein the waveguide is coupled to at least one optical coupler.
42. (New) The method of Claim 35 wherein the waveguide is coupled to at least one optical circulator.